PROJECT TITLE : Unit Operations I

PERIOD COVERED : January 7th - 25th, 1980

WRITTEN BY : P. Karbacher

Nitrate Reduction of Strips

Permeability of Strips

The results of the permeability tests were received from Ex-Technik in Hamburg and De Smet in Antwerp. Also our trials on our make shift unit were finished.
All these results are within the same range. The table on the next page shows the results from Ex-Technik (Ex-Technik calls the permeability percolation) (Ref. 1).
These results show that a strip extraction is possible. The permeability (percolation) rate depends on the extraction temperature and the filling level of the strips in the extractor. By high extraction temperatures a good extract concentration is obtained but the permeability rate is low. The ideal ratio between the extraction temperature and the filling level of strips must still be found.

Rent of an Ex-Technik Small Scale Extractor

After obtaining such good permeability results we have decided to rent a small scale extractor from Ex-Technik.
Mr. Lüthi went to Hamburg to arrange all the details concerning this hire. The time table sets the start of the extraction trials with the rented unit between the middle and the end of February.

Visit to Ex-Technik in Hamburg

See monthly report Mr. N. Lüthi.

Ninomass

Contact has been taken with Aeromatic SA about renting a spray dryer. We need the dried Ninomass for trials at VLGZ (Ref. 2).

Results of percolation * trials made by Ex-Technik (Ref. 1).

Trial number	1	2	3	4	
Quantity of strips	400 g	400 g	800 g	400 g	
Quantity of water	6.0 kg	6.0 kg	12.0 kg	5.0 kg	
Filling level of strips	450 mm	450 mm	890 mm	490 mm	
Strips density in the extractor	0.11	0.11	0.11	0.10	kg/dm^3
Filling level of strips after the extraction	390 mm	380 mm	690 mm	390 mm	
Extraction temperature	20-30°C	60°C	70°C	70°C	
Percolation rate after :					
10 min	245	110	70	80	l/dm^2h
20 min	185	100	45	90	l/dm^2h
30 min	140	60	35	80	l/dm^2h
40 min	130	55	25	60	l/dm^2h
50 min	105	40	20	60	l/dm^2h
60 min	105	40	20	60	l/dm^2h
Extract concentration after a percolation time of :					
10 min	-	1.91	1.88	1.90	weight %
20 min	-	2.03	2.07	2.28	weight %
30 min	-	2.12	2.12	2.41	weight %
40 min	-	2.17	2.17	2.50	weight %
50 min	-	-	2.21	2.54	weight %
60 min	1.93	2.2	2.24	2.56	weight %

* Ex-Technik calls the permeability percolation

Miscellaneous

Some help was given to Mr. Lüthi concerning dust sieving.

References

1) Report from Mr. Jess Ex-Technik Hamburg : Extraction of tobacco for nitrate reduction; January 9th, 1980.

2) Memo from P. Karbacher to B. Krasna; November 27th, 1979.

PROCESS DEVELOPMENT

P. Karbacher

January 29th, 1980
KPA/sde